

FEATURES OF CLINICAL MANIFESTATIONS OF COMORBID PATHOLOGY IN CHRONIC GASTRODUODENITIS ASSOCIATED WITH HELICOBACTERIOSIS IN CHILDREN

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ABSTRACT

The results of characterization of clinical manifestations of comorbid pathology in chronic gastroduodenitis in children associated with helicobacteriosis are highlighted. The analysis showed that in this group of children, compared with the control group, a high value of the comorbidity index was found, which has a prognostic value for detecting a variety of concomitant conditions that aggravate the course of the underlying disease. It is concluded that the use of comorbidity index parameters is an additional criterion for assessing the occurrence of extravagant manifestations in chronic gastroduodenitis associated with helicobacteriosis.

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1. INTRODUCTION

According to information received by the World Health Organization, *Helicobacter pylori* is infected up to 50% of the population of developed countries and up to 75-95% of the population of developing countries [7; p.67-71, 8; p.851-859, 11; p.19-25, 13; p.991-1003, 15; p.1233-1243]. To date, the diagnosis and treatment of *Helicobacter pylori* infection in children, regardless of the current trend in reducing the incidence of gastric and duodenal ulcers, remain as relevant as ever. *Helicobacter pylori*, staying unnoticed and for a long time in the child's body, causes inflammation of the digestive tract, weakens the immune system and creates prerequisites for a number of extra-gastric diseases [1; p.70-76, 2; p.24-30, 3; p.15-22, 4;

p.53-54, 12; p.176-178, 14; p.899-905, 16; p.701-723, 18; p.681-685]. The presence of concomitant diseases is one of the risk factors that adversely affects the course and outcome of the main pathological process. It has been shown that in the case of comorbid conditions, the risk of complications increases, resistance to traditional therapy, as a result of which the length of hospitalization and financial costs increase [6; p.7-14]. In turn, the presence of concomitant pathology contributes to the progression of the main disease and worsening its prognosis [5; p.1-16, 9; p.21-32, 10; p.143-150]. Helicobacter infection is also considered one of the important factors contributing to the formation of concomitant pathological conditions. This is due to the role of this infectious agent in the development of chronic gastroduodenitis, manifestations of malabsorption, iron deficiency and iron deficiency anemia, vitamin B12 deficiency, growth retardation in adolescents, skin diseases, chronic eschar, atopic dermatitis, food allergy - a total of 120 diseases, etc.

Considering that comorbidity is understood to be a combination of two or more independent diseases in one patient, associated with a single pathogenetic link and progression. In pediatric practice, there are few works dedicated to the problem of comorbidity, in connection with which our research on the study of comorbid conditions in children with chronic gastroduodenitis associated with Helicobacter pylori is of particular interest.

The aim of the study is to improve early diagnosis of comorbid diseases in children with chronic gastroduodenitis associated with Helicobacter pylori infection.

Materials and methods. A total of 106 children aged 7 to 16 years with a diagnosis of chronic gastroduodenitis were examined, who were undergoing treatment at the gastroenterology department and the consultative-diagnostic clinic of the Republican Specialized Scientific and Practical Medical Center of Pediatrics. The main group consisted of 76 (71.6%) patients with Helicobacter pylori-associated chronic gastroduodenitis and the comparison group consisted of 30 (28.3%) patients with Helicobacter pylori-associated chronic gastroduodenitis.

Children's physical development was assessed in accordance with the World Health Organization's (www.who.int/childgrowth) 2006 standard for children's growth and development (www.who.int/childgrowth).

The diagnosis of chronic gastroduodenitis was determined according to the classification of A.V. Mazurin (1994). Helicobacter pylori was detected by enzyme-linked immunosorbent assay in stool;

- The criteria for the diagnosis of "food allergy" were the presence of a positive allergological and food history; characteristic clinical manifestations of the disease; the presence in the blood serum of general and specific IgE to food allergens, determined by the method of immunosorbent analysis; increased level of lymphotoxin to food antigens; eliminating effect.

To diagnose atopic dermatitis in children, Yu.K. Skripkin's classification and the SCORAD international scale were used to assess the severity of the disease.

- The level of physical development of children was assessed in accordance with the generally accepted standards of growth and development of children (www.who.int/childgrowth) recommended by WHO for 2006.

In the process of comprehensive clinical and laboratory examination of children, general clinical, immunological, biochemical, instrumental and statistical research methods were used.

- the risk factors for the development of the disease were assessed, the relative risk coefficient (RR) was analyzed, with a relative risk greater than one ($RR > 2$) showing a higher level in the main group compared to the comparison group. (E.P. Pavlovich 2021);

- the comorbidity index was assessed (Charlson M.E. et al., 1987);

- to study the ferrokinetic parameters, an enzyme-linked immunosorbent assay of blood serum iron, ferritin concentration, transferrin concentration in blood serum, and the total iron-binding capacity of blood serum were performed;
- all children with chronic gastroduodenitis underwent EGDS examination using an Olympus GIF 80 flexible fibrocolonoscope and ultrasound of the abdominal organs using "Toshiba Aplio 500" (Japan);
- the optical density of intestinal barrier permeability in chronic gastroduodenitis with Nr-association was studied (Petrov V.I., Novochadov V.V., Smolenov I.V., Degteva N.V., 2003);
- the total IgE level in blood serum was determined by enzyme immunoassay.

Statistical processing of the results was carried out using the method of variational statistics according to the program developed in the Microsoft Office Excel 2010 folder, calculating the arithmetic mean (M), standard errors (m), confidence intervals (σ) and significant differences according to the student's t-test. The results were considered statistically significant at $p < 0.05$.

Results and their discussion: among the children examined, the number of younger schoolchildren aged 7-11 years was 40 (52.6%), and the number of older schoolchildren aged 12-16 years was 36 (47.3%). Children with *Helicobacter pylori*-associated chronic gastroduodenitis were found in 37 (48.6%) boys and 39 (51.3%) girls, i.e., no gender differences were found in the quantitative composition. The average age of the children was 11.3 ± 0.6 . The duration of the disease was 5.4 ± 0.9 years. (tab. 1).

Table 1. Distribution of children by gender and age

Nozology	Boys n=52		Girls n=54		7-11 n=55		12-16 n=51	
	abs	%	abs	%	abs	%	abs	%
<i>Helicobacter pylori</i> -associated chronic gastroduodenitis n=76 (main group)	37	48,6	39	51,3	40	52,6	36	47,3
Chronic gastroduodenitis not associated with <i>Helicobacter pylori</i> n=30 (comparison group)	15	50	15	50,0	15	50,0	15	50,0

Analysis of the characteristics of hereditary burden in patients with chronic gastroduodenitis in children depending on the association with *Helicobacter pylori* revealed the following: heredity of allergic diseases and gastrointestinal diseases was complicated, including in group I in 27 (35.3%) and 56 (73.6%), in group II in 2 (6.6%) and 10 (33.3%) ($P < 0.05$); ($P < 0.01$). However, the study found that the combined severity of diseases in the first group of children significantly exceeded the similar indicator in the second group of children. Children in the first group had an average of 3 times more diseases than their peers in the second group. This indicates a higher level of morbidity among children in the first group. The study revealed that a significant number of patients with *Helicobacter pylori* infection had first and second-degree relatives with stomach or duodenal diseases (51.3%). In one case, the infection was found in the child's parents. It is noteworthy that in 48 (63.1%) cases, a genetic predisposition was observed on the maternal line. Anemia in the mother during and after pregnancy was detected in 44 (57.8%) patients in the first group and 6 (3.3%) in

the second group, respectively. According to our data, the analysis of physical development indicators in children with chronic gastroduodenitis depending on the association of *Helicobacter pylori* showed that in the first group of children, the weight index by age within the -1CO limit was more often observed in girls compared to the control group, respectively, in 20 (51.2%) and 3 (20.0%). Analysis of body mass index indicators showed that the number of children with protein-energy deficiency with mild pathology was higher in the second group of children.

The average age of the children we examined was 11.3 ± 0.6 years. Anamnestic data analysis revealed that 30 (39.4%) of the children's mothers had a history of pregnancy pathology, with preeclampsia and toxicosis being the most common complications. Every fourth child in the family had an unfavorable course of labor, such as asphyxia, preterm labor, or cesarean section.

Considering that comorbidity in pediatric gastroenterology is not accidental, it can occur in the form of syntropy or interference, in most cases leads to the aggravation of the course of the underlying disease and, of course, requires not only timely diagnosis of combined lesions, however, with adequate comprehensive therapy, we conducted an analysis of the structure of non-steroidal comorbidities in children with chronic gastroduodenitis depending on the association of *Helicobacter pylori* with the comorbidity index analysis, which was calculated as the sum of all concomitant conditions observed in the child at the time of the study. According to the comorbidity index data obtained, the children were divided into the following groups. The first group, where the comorbidity index is low (less than 3 comorbidities), included 38 (50.0%) children from the main group and 36 (11.0%) children from the comparison group. The second group - average comorbidity index (4-5 comorbidities); in the main group, 26 (34.1%) children, in the comparison group - 7 (23.3%) children; the third group, where the comorbidity index is high (more than 6 pathological conditions) in the main group - 12 (15.7%) sick children, and in the comparison group - no cases.

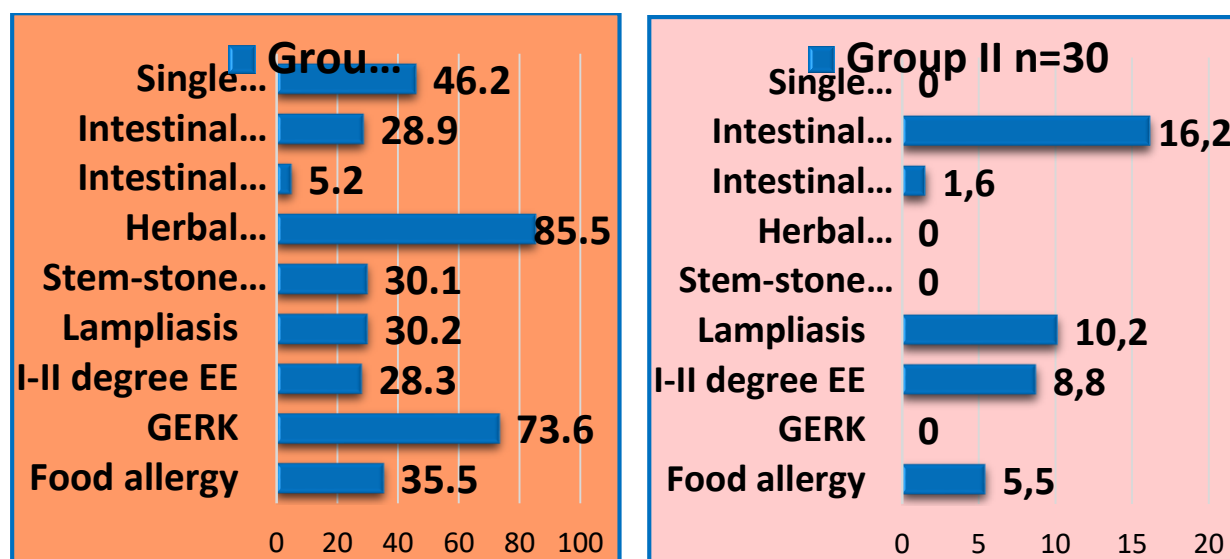


Figure 1. The spectrum of comorbid pathologies in children with chronic gastroduodenitis, depending on the association of Hp with pathologies developing in the digestive tract, but not in the stomach and duodenum.

When assessing the comorbidity index, all children with chronic gastroduodenitis exhibited two or more comorbidities, while 48 (45.2%) patients exhibited three or more comorbidities.

The structure of comorbid conditions manifested in *Helicobacter pylori*-associated non-stomach diseases in chronic gastroduodenitis, but within the gastrointestinal tract included the following pathologies of the gastrointestinal tract: in 80 (75.4%) - gallbladder dyskinesia, in 32 (30.1%) - biliary sludge, in 49 (46.2%) - Oddi sphincter dysfunction of the pancreatic type, in 33 (31.1%) - irritable bowel syndrome (Fig. 1).

Analysis of the obtained data showed that in the group of children with chronic gastroduodenitis within the digestive tract, but associated with *Helicobacter pylori* infection, the spectrum of comorbid pathologies associated with *Helicobacter pylori* association was 33 (43.4%) cases: gallbladder dyskinesia - 65 (85.5%); biliary sludge - 23 (30.2%); Oddi dysfunction depending on the type of pancreatic disease - 35 (46.0%) and in the comparison group - 7 (2.3%); bowel irritation syndrome with constipation - in 22 (28.9%) and in the comparison group - in 5 (16.6%); bowel irritation syndrome with sneezing - in 6 (7.89%) and in the comparison group - in 2 (6.6%); gastroesophageal reflux disease - in 56 (73.6%) and in the comparison group - in 1 (3.3%); protein-energy insufficiency - in 22 (28.9%) (fig. 2).

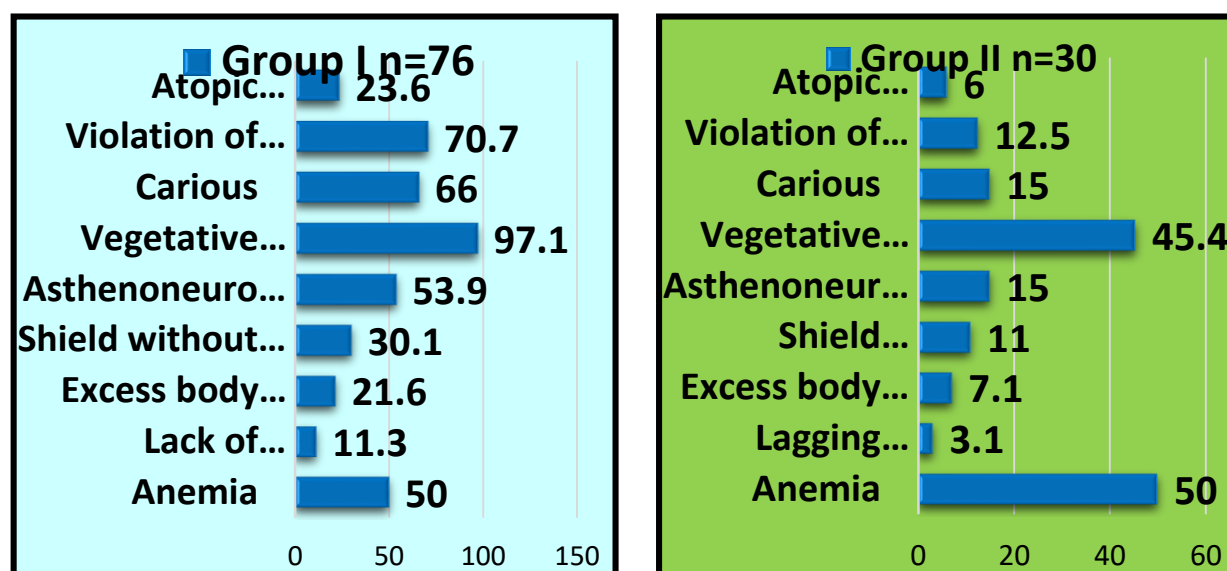


Figure 2. The spectrum of comorbid diseases in children with chronic gastroduodenitis, depending on the association of *Helicobacter pylori* with diseases developing outside the gastrointestinal tract.

Comorbid diseases developing outside of the digestive system, but associated with *Helicobacter pylori*, were found in 43 (56.5%) children: changes in the musculoskeletal system (posture disorders - 54 (71.0%) and 4 (30.0%); caries - 50 (65.7%) and 5 (16.6%); autonomic nervous system (vegetative dysfunctions were found in almost 100% of cases) - 74 (97.3%) and 14 (46.6%); central nervous system (neuro-like and asthenoneurotic conditions - 40 (52.6%) and 6 (20.0%)), as well as food status disorders in the form of excess body weight - 16 (21.0%) and 2 (6.6%) (Fig. 2).

It has been shown that the presence of concomitant conditions (4 or more) was an additional factor that worsened the course of chronic gastroduodenitis (Table. 2).

Table 1. Comorbidity index in children with chronic gastroduodenitis depending on *Helicobacter pylori* association

group I n=76			group II n=30	
	abs	%	abs	%
I	38	50,0	11	36,0
II	26	34,2	7	23,3
III	12	15,7	0	0

Conclusion. Thus, the spectrum of *Helicobacter pylori* persistence-related comorbid pathology in the group of patients with chronic gastroduodenitis associated with *Helicobacter pylori* infection manifested as pathological conditions developing outside the stomach and duodenum, however, within the gastrointestinal tract, 33 (43.4%) patients had diseases developing outside the gastrointestinal tract, but 38 (50.0%) patients had *Helicobacter pylori*-associated diseases, early assessment of which effectively prevented severe course, unpleasant consequences of the disease, and reduced costs for patients.

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